alkaline by ammonia or liquor potassæ it was not sterilized except after an exposure to 212° F. for more than an hour; sometimes it germinated after two and once after three hours' exposure. The two factors—duration of heat and its degree—seem to be mutually compensatory, a longer exposure to a lower heat being equivalent to a shorter exposure to a higher temperature. Speaking roughly, an exposure for an hour to a heat of 212° F. appeared to be equivalent to an exposure of fifteen minutes to 228° F.

Section 2 is devoted to the capabilities of the normal tissues and juices to generate Bacteria and Torulæ without extraneous infection. Egg albumen, blood serum, blister serum, milk, grape, orange, and tomato juice, turnip, and potato tissue—these were rapidly removed from their ordinary sites and placed in sterilized tubes, and kept at temperatures varying from 60° to 90°, and the rarity with which Bacteria and Torulæ were developed when the last conditions of the experiment were carefully preserved led to the conclusion that the normal tissues of plants and animals were incapable of breeding Bacteria and Torulæ except under the stimulus of extraneous infection.

The third section is devoted to the bearing of these facts, which is that ordinary air and water contain, in addition to their proper elements, multitudes of particles capable of provoking germination. Dr. Roberts is therefore a panspermist, and he observes that were it hereafter established that bacteria and fungoid vegetations do under exceptional instances arise abiogenically, it would not overturn the panspermic theory, but would merely limit the universality of its application.—*Brit. and For. Med.-Chirurg. Rev.*, Jan. 1875, from *Proceed. Roy. Soc.*, vol. xxii. p. 289.

---

4. *Dependence of the Arterial Blood-pressure on the Quantity of Blood.*—WORM MULLER's experiments on dogs have established the remarkable fact that the vascular system can accommodate very large quantities of blood without there being any marked increase of the normal arterial blood-pressure, which was always measured in the carotid. More than sixteen per cent. of the body weight of the animal in blood could be injected into the jugular vein without (after the termination of the transfusion) the blood-pressure in the beginning of the aortic system becoming markedly higher than it was in the normal dog before the commencement of the experiment, *i. e.* the quantity of blood that the animal originally had, could be increased to three times its original amount without producing any marked increase in the arterial blood-pressure. Within certain limits this holds good, if the blood-pressure had been diminished either by section of the spinal cord, or by blood-letting. As soon, during the injection, as the blood-pressure had reached the value noted before the beginning of the experiment, the addition of several quantities of defibrinated blood did not raise the pressure above the normal. That the blood, in spite of the over-filling of the vascular system, remained within it, and that no important exit of blood or blood-plasma took place through the walls of the vessels, was established by the negative results after very careful *post-mortem* examination. To dispose of the idea of a simple serous exudation, the thoracic duct was opened to observe the out-flow of lymph during and after the injection of the defibrinated blood. The rapidity of the lymph current increased with the quantity of blood added, but a sinking of the blood-pressure with increased quantity of lymph was not observed. A direct proof of the overfilling of the vascular system is given in the effects of blood-lettings in an animal into which blood had been previously transferred. From such an animal quantities of blood, not sufficient to endanger the life of the animal, were withdrawn from the carotid, and from this animal, overfilled as it was with blood, on continuing the blood-lettings until death ensued, and even by pressing the limbs and body of the moribund animal, scarcely ever was the quantity of blood transfused again recovered. The results of the *post-mortem* examination showed no marked overfilling of the arteries, and only in the veins of the abdomen was there any appreciable overfilling observed. The author is of opinion that after transfusion, the blood is specially to be found in the capillaries distributed more or less over the whole body. He is further of opinion that the increase in the capacity of the vascular system is accomplished by the help of the capillary networks, of the smallest veins, and

the smallest arteries. Very probably throughout the whole body under normal conditions, many capillaries entirely empty or only partially filled exist, which become permeable to the blood-current, after considerable increase of the quantity of blood. A distension of the capillary networks is not a necessary consequence of the overfilling. This occurs, however, under very pronounced filling of the vascular cavities with blood, and as the author believes, at those places and in those organs, such as in the thoracic and abdominal cavities, where the overfilling is most observable.

Even with pronounced filling of the vascular system no change in the capacity of the heart for doing work (*Leistungsfähigkeit*) occurred. The pulse-beats remained with increased percentage of blood, either unchanged both in animals with divided and in those with intact spinal cord, or they were diminished so irregularly that the latter point could only under certain circumstances be brought into account. The lungs were found congested *post-mortem*. An increased friction of the blood in the lungs is not alone sufficient to explain the non-increase of the blood-pressure. Neither congestion of the right heart nor of the large veins which open into it was found.

If after transfusion the quantity of blood in the transfused animal was diminished, the paradoxical phenomenon was exhibited that before one-half of the blood injected was recovered, the arterial blood-pressure sank much below the *niveau* which it had before the transfusion. By continuing the blood-letting the animal could be brought near to death, even though the quantity of blood which it had, surpassed by several per cents. of its body-weight the original (normal) quantity of blood; in other words, animals which had received from one to three times their original quantity of blood were much more sensitive to blood-letting than in the normal condition. Absolutely, transfused animals yield more blood on being bled to death, which is easily explained by the strongly pronounced filling of the vascular system, but relatively they require much larger, perhaps twice as large, or may be still larger quantities of blood (than in the non-transfused condition), in order to preserve the normal blood-pressure, *i. e.* that necessary for life. In an animal which has been bled from both carotids, until nearly dead, even after blood has ceased to flow from the divided arteries, blood again flows from the carotid on dividing the cervical spinal cord (this observation I have repeatedly verified. *Rep.*), and the stream is increased on raising the posterior extremities and pressing on the abdominal and thoracic walls. The author then discusses the upper and lower limits of the physiological filling of the vascular system, and then follows a short chapter on plethora and transfusion.—*Journ. Anat. and Phys.*, Nov. 1874, from *Ludwig's Arbeiten*, viii. 159.

5. *Acid of the Gastric Juice.*—M. **Rabuteau**, at a late meeting of the Academy of Sciences in January last, communicated the result of experiments made by him to determine the nature of the acid which causes the acidity of the gastric juice. His results conform to those of Braconnot, Prout, Lassaigne, and Schmidt, that the gastric juice owes its acidity to hydrochloric, and not to lactic acid.—*Le Movement Médical*, Feb. 6, 1875.

MATERIA MEDICA, GENERAL THERAPEUTICS, AND PHARMACY.

6. *Properties of Jaborandi.*—An additional supply of this new and remarkable drug has been lately received both in France and England, which has enabled investigators to determine more definitely its source, its properties, and to some extent its therapeutic application.

The results of these investigations are so very interesting as to seem to require a full account of them to be given here.

Prof. **Gubler**, at a meeting of the *Société de Thérapeutique*, exhibited